

Accuphase

P-300

C-200

T-100



Accuphase C-200

STEREO CONTROL CENTER

A good control center must be able to preamplify program source signals faithfully without changing their characteristics. It must also be able to provide compensation, when required, for room acoustics or deficiencies in program source signals. To satisfy the first requirement of fidelity, a good control center must have excellent characteristics such as wide dynamic range, flat frequency response, low noise and low distortion, as well as the ability to amplify and deliver a true replica of the input pulse signal. As for its second function of supplying compensation, it must have excellent equalization and other circuitry that can be finely adjusted, as well as efficient filters to cut off noise. Moreover, a good control center must have plenty of input connectors, and its controls should be well laid out to avoid complexity.

The Accuphase C-200, which was designed to serve as a top class control center, easily meets all these requirements, and more. Every stage is push-pull driven and powered by dual power supplies. Input voltages up to 400 mVrms can be handled, a maximum for equalizer amplifiers. Its 10 inputs and 7 outputs, and a total of 28 controls attest to its functional diversity. Yet it is simple to operate. Excellent design and full utilization of its front and front-sub panels have made this possible.

ORIGINALITY MARKS EQUALIZER CIRCUITRY

(a) Differential amplification—push-pull circuitry throughout

Direct-coupled, complementary symmetrical circuit in every stage assures very excellent fidelity and outstanding stability.

(b) Easily handles dynamic range inputs

Employment of complementary symmetry Class A driver amplifier in the final stage and use of plus, minus dual power supplies enable the C-200 to handle wide dynamic range inputs as large as 400 mVrms at 1 kHz with distortion ratio less than 0.05%. This rating applies with the equalizer amplifier gain set at 40 dB. If it is set to 30 dB, input voltages up to 1.2 Vrms can be handled.

(c) Low enhancement circuit has fine adjustment of "pregnancy"

The C-200 is equipped with a LOW ENHANCE switch which accentuates rich bass tones that add to music enjoyment. This switch offers selection of 0, +0.5 and +1 dB change against the RIAA characteristic curve at 100 Hz.

(d) Disc input level control has 10 dB variation

A 10 dB continuously variable attenuator is available to attenuate cartridge output, when excessive, to a suitable level. It also permits comparison of cartridges connected to DISC 1 and DISC 2, and equalization of their levels.

(e) Disc input has impedance matching switch

The C-200 is equipped with an impedance matching switch which provides selection of 30 K, 47 K and 100 Kohms input impedances at DISC 1. This makes impedance matching easy, especially to moving coil cartridges connected through step-up coupling transformers that require different optimum impedances depending on the make. It eliminates mismatching impedances at disc input connections which deteriorate sound quality.

(f) Subsonic filter prevents intermodulation distortion

Subsonic vibrations of the turntable motor, etc., when playing records, should be cut before they can enter the input since they may otherwise cause intermodulation distortion. The C-200 has a subsonic filter that provides this sharp cut-off at 25 Hz.



WIDE CHOICE OF TONE VARIATION

(a) 10-step bass control, plus two turnover frequencies

Every shade of bass tone variation is at your fingertips with the C-200 which offers 10-step rotary switch control for each channel, plus a choice of 200 Hz or 400 Hz turnover frequencies. These turnover frequencies provide a variation range of ± 10 dB (at 100 Hz for 400 Hz turnover, at 50 Hz for 200 Hz turnover).

(b) 10-step treble control, plus two turnover frequencies

Likewise every shade of treble control is also available through 10-step selection for each channel, plus choice of 2.5 kHz and 5 kHz turnover frequencies that provide a variation range of ± 10 dB (at 10 kHz for 2.5 kHz turnover, 20 kHz for 5 kHz turnover).

An independent switch is provided to turn the tone control circuit ON or OFF.

LOW, HIGH FILTERS

(a) Low Filter with 18 dB/oct cut-off at 30 Hz

The C-200 has a built-in low filter which can cut off at 18 dB/oct, all subsonic vibrations below 30 Hz which are likely to cause intermodulation distortion.

(b) High Filter with 12 dB/oct cut-off at 5 kHz

It also has a 12 dB/oct cut-off High Filter for 5 kHz which very effectively cuts high frequency noise without essentially affecting music quality.



PLENTY OF INPUT/OUTPUT CONNECTORS

A total of 10 inputs and 7 outputs are available, which should meet the needs of any assortment of program sources or sound equipment test connections. Of these, 3 inputs MIC, AUX and TAPE PLAY, and three outputs, TAPE REC, MAIN OUTPUT, and HEADPHONE are conveniently available on the front sub-panel.

THREE TAPE RECORDERS CAN BE CONNECTED

Inputs and outputs for connecting three tape recorders are available, of which two can be used for tape copying from one tape deck to the other. This function can be carried on while simultaneously listening to a different program source, since an independent tape copy switch is provided.

COMPLEMENTARY-SYMMETRY CIRCUIT HEADPHONE AMP.

A direct-coupled, complementary-symmetry circuit amplifier, made available exclusively for headphone use, upgrades the quality of headphone reproduction that is available through the C-200.

WELL REGULATED POWER SUPPLY

The well-regulated power supply is fully capable of supplying steady, non-fluctuating voltages to all amplifier stages and it is totally unaffected by any kind of input signal. This power supply is also capable of well-regulated performance even against reasonable AC line voltage fluctuations.

SPEAKER SWITCHING THROUGH OPTIONAL RELAY BOX

In installations where the power amplifier may not be close at hand, speaker selection is possible through the C-200's front panel Speaker Selector switches when a Relay Box (optional equip.) is connected.

QUANTY SPECIFICATIONS

PERFORMANCE GUARANTY:

Products of Accuphase guarantee specifications stated.

FREQUENCY RESPONSE:

High level input: +0, -0.2 dB 20 Hz to 20,000 Hz
Low level input: +0.2, -0.2 dB 20 Hz to 20,000 Hz

DISORTION:

Lower than 0.05% at rated output level, 20 Hz to 20,000 Hz

INPUT SENSITIVITY AND IMPEDANCE:

Disc 1: 2-8mV; 30 k ohms, 47 k ohms, 100 k ohms
Disc 2: 2-8mV; 47 k ohms
Mic: 2mV; 47 k ohms
Tuner: 200mV; 130 k ohms
Aux 1, 2, FRONT: 200mV; 130 k ohms
Tape Play 1, 2, FRONT: 200mV; 130 k ohms
(* 2-8mV Variable)

MAXIMUM INPUT FOR DISC INPUT:

400mV RMS at disc level control maximum for 1 kHz
1.2V RMS at disc level control minimum for 1 kHz
400mV - 1.2Vrms distortion 0.05% at 1 kHz

OUTPUT LEVEL AND IMPEDANCE:

Main Output: 2.0V; 200 ohms
Headphones: 0.4V; 0.3 ohms
Tape Rec. 1, 2, FRONT: 200mV; 200 ohms
Mono Output: 0.42V; 38 k ohms
(* at rated input, volume control maximum)

MAXIMUM OUTPUT LEVEL:

10 Volts at 0.05% distortion

VOLTAGE AMPLIFICATION IN DECIBELS:

Tuner, Aux, Tape Play input:
to Main Output: 20 dB
to Tape Rec.; 0 dB
to Headphones; 6 dB
Disc 1, Disc 2 and Mic Input (at 1 kHz):
to Main Output; 60 dB
to Tape Rec.; 40 dB
to Headphones; 46 dB

HUM AND NOISE:

Tuner, Aux, Tape Play: 90 dB below rated output.
Disc, Mic: 74 dB below 10mV input.

TONE Controls:

10-step Rotary Switch for each channel with turnover frequency Switches.

BASS:

Turnover frequency 400 Hz: ± 10 dB (2 dB step) at 100 Hz
Turnover frequency 200 Hz: ± 10 dB (2 dB step) at 50 Hz

TREBLE:

Turnover frequency 2,500 Hz: ± 10 dB (2 dB step) at 10,000 Hz
Turnover frequency 5,000 Hz: ± 10 dB (2 dB step) at 20,000 Hz

DISC LOW ENHANCEMENT (for Disc input):

0 dB, +0.5 dB, +1 dB at 100 Hz to RIAA standard characteristics.
Bass tone becomes richer when switched to +0.5 dB or 1 dB.

COMPENSATOR:

ON position boosts low frequencies for low level listening.
+9 dB at 50 Hz (at volume control -30 dB)

FILTERS:

Disc Subsonic Filter: 25 Hz cutoff 6 dB/oct
Low Filter: 30 Hz cutoff 18 dB/oct
High Filter: 5,000 Hz cutoff 12 dB/oct

VOLUME CONTROL:

Less than 1 dB tracking error control down to -60 dB.

POWER REQUIREMENT:

Voltage selector for 100V, 117V, 220V, 240V 50/60 Hz operation.
Consumption: 36 Watts

SEMICONDUCTOR COMPLEMENT:

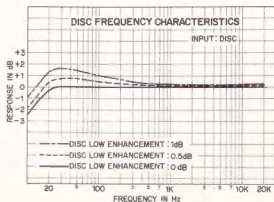
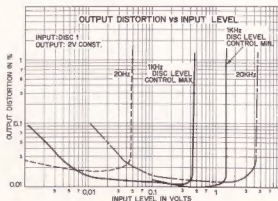
80 Transistors, 35 Diodes

DIMENSIONS:

445mm (17 1/2 inches) wide, 152mm (6 inches) high, 355mm (14 inches) deep

WEIGHT:

14 kgr. (30.8 lbs.) net, 18.3 kgr. (40.6 lbs.) in shipping carton.



E-202

INTEGRATED STEREO AMPLIFIER



The Accuphase E-202 is a top class integrated Amplifier with separate component grade features and characteristics. It delivers 100 Watts Per Channel RMS into 8 ohms with less than 0.1% distortion from 20 to 20,000Hz. This high power capability is backed up by heavy duty power transistors in a parallel push-pull drive output stage. The three position Speaker Damping Control allows one to gain the maximum performance from your speakers. The preamplifier section is loaded with features such as, Disc Low Enhancement, Subsonic Filter, Switchable Disc Impedance Selector and provision for connection of up to three tape decks with independent dubbing. The E-202 combines the best of separate components into a single unit with performance that rivals many.

POWER OUTPUT: (both channels driven from 20Hz to 20,000Hz with no more than 0.1% total harmonic distortion):
140 watts per channel, min. RMS, at 4 ohms
100 watts per channel, min. RMS, at 8 ohms
80 watts per channel, min. RMS, at 16 ohms

TOTAL HARMONIC DISTORTION: (from 20Hz to 20,000Hz at any power output from 1/4 watt to rated power)
4 ohms; 0.15% max.
8 ohms; 0.15% max.
16 ohms; 0.15% max.

INTERMODULATION DISTORTION: (High Level Input to Main Output)
will not exceed 0.1% at rated power output for any combination of frequencies between 20Hz and 20,000Hz

FREQUENCY RESPONSE: Main Amp. Input: +0, -0.2dB
High Level Input: +0, -0.5dB
Low Level Input: +0, -1.0dB
(at rated power output from 20Hz to 20,000Hz)

DAMPING FACTOR: (at 8 ohms load, 20Hz to 20,000Hz)
with "SPEAKER DAMPING" switch set to:
"NORMAL" "MEDIUM" "SOFT"
50 5 1

INPUT SENSITIVITY AND IMPEDANCE:
Disc 1: 2.5-5mV, 20K ohms, 47K ohms, 100K ohms
Disc 2: 2.5mV, 47K ohms
High Level Input: 150mV, 100K ohms
Main Amp. Input: 1.0V, 100K ohms
(*2.5-5mV variable)

MAXIMUM INPUT FOR LOW LEVEL INPUT:

Disc 1: 300mV RMS at disc level control maximum for 1kHz
Disc 1: 600mV RMS at disc level control minimum for 1kHz
Disc 2: 300mV RMS
(distortion 0.00% at 1 kHz)

OUTPUT LEVEL AND IMPEDANCE:

Preamp. Output: 1.0V, 600 ohms (at rated input level)
Tape Rec. 1, 2: 150mV, 200 ohms (at rated input level)

HEADPHONE JACK:

For listening with low impedance (4-32 ohm) dynamic stereo headphones

VOLUME AMPLIFICATION IN DECIBELS:

Main Amp. Input to Output: 29 dB
High Level Input to Preamp. Output: 16dB (at VOLUME control maximum)

Low Level Input to Tape Rec.: 36dB (Disc 1 level control provides 6dB variation)

HUM AND NOISE:

Main Amp. Input: 94dB below rated output
High Level Input: 80dB below rated output
Low Level Input: 74dB below rated output

when adjusted for 10mV input at 1kHz
BASS/TREBLE controls: 16-step Rotary Switch for both channels with ON-OFF switch. Tone is varied in 2 dB steps.

BASS turnover frequency: 400Hz, ±10dB at 100Hz

TREBLE turnover frequency: 2.5kHz, ±10dB at 10,000Hz

VOLUME control: Less than 1dB tracking error.
COMPENSATOR: ON position boosts low frequencies for low level listening.

+9dB boost at 50Hz when the volume knob is adjusted to -30dB position.
DISC LOW ENHANCEMENT (for Disc inputs):
+10dB at 100Hz to RIAA standard characteristics with "LOW ENHANCEMENT" switch set to ON position.

FILTERS: Disc Subsonic Filter: 25Hz cutoff/ 50dB/oct
Low Filter: 30Hz cutoff/ 18dB/oct
High Filter: 5kHz cutoff/ 12dB/oct

POWER LEVEL METER:

Meter is calibrated to read dB when amplifier produces 100 watts into 8 ohms load.
METER RANGE switch is provided to increase meter sensitivity by 10dB or 20dB.

OUTPUT LOAD IMPEDANCE: 4, 8 and 16 ohms

POWER REQUIREMENT:

Voltage selector for 100V, 117V, 220V, 240V 50/60Hz operation
Consumption: 70 watts at zero signal output
375 watts at rated power output into 8 ohms load

SEMICONDUCTOR COMPLIMENT:

53 Transistors, 4 FET's, 44 diodes, 2 Transistors
DIMENSIONS: 450mm (18 inches) wide, 152mm (6 inches) high,
360mm (14 inches) deep

WEIGHT: 19.5 kg (42.9 lbs.) net, 23.8 kg (52.3 lbs) in shipping carton.

M-60 MONOPHONIC POWER AMPLIFIER



The ACCUPHASE Monophonic Power Amplifier Model M-60 was completed after extensive engineering efforts in which perfection was sought without compromises. Monophonic design was chosen to completely eliminate any possibility of inter-channel interferences from power supply circuit and wirings, and also to feature a handy weight so that it can be handled even by one person. The M-60 provides 19" rack mounting facilities and a cannon type input terminal for studio monitor or PA system applications.

*Guaranty Specifications

Performance Guaranty:
Products of Accuphase guarantee specifications stated.

POWER OUTPUT:

(from 20Hz to 20,000Hz with no more than 0.1% total harmonic distortion):

450 watts, min. RMS, at 4 ohms
300 watts, min. RMS, at 8 ohms
150 watts, min. RMS, at 16 ohms

TOTAL HARMONIC DISTORTION:

(from 20Hz to 20,000Hz at any power output from 1/4 watt to rated power):

4 ohms; 0.1% max.
8 ohms; 0.1% max.
16 ohms; 0.1% max.

INTERMODULATION DISTORTION:

will not exceed 0.1% at rated power output for any combination of frequencies between 20Hz and 20,000Hz

FREQUENCY RESPONSE:

20Hz to 20,000Hz: +0, -0.2dB at rated power output
2Hz to 90,000Hz: +0, -3dB at rated power output

DAMPING FACTOR:

45 in 8 ohm load, 20Hz to 20,000Hz

RISE TIME:

3 μ Sec.

BLEWING RATE:

25 V/ μ Sec.

INPUT SENSITIVITY AND IMPEDANCE:

2.0 Volts, 100 Kohms, for rated output at the maximum level control

HUM AND NOISE:

100dB below rated output.

OUTPUT LOAD IMPEDANCE:

4, 8 and 16 ohms

SUBSONIC FILTER:

cutoff frequency: 17Hz, 18dB/oct.

POWER LEVEL METER:

switchable for Volume Level and Peak Level,
calibrated to read 0dB = 300 watts into 8 ohm load and capable of
directly reading down to -50dB (3 mW)

ATTENUATOR:

precision, 1dB stepping type

POWER REQUIREMENT:

voltage selector for 100V, 117V, 220V, 240V 50/60Hz operation
Consumption: 60 watts at zero signal output

540 watts at rated output 8 ohm load
800 watts at rated output 16 ohm load

SEMICONDUCTOR COMPLEMENT:

47 transistors, 51 diodes, 3 IC's

DIMENSIONS:

482mm (19 inches) wide, 170mm (6 11/16 inches) high,
345mm (13 9/16 inches) deep

*mountable on 19" standard rack, rack mount pinch, 100mm (4")
rack inside horizontal measurement, 430mm (16 15/16")

WEIGHT:

27kgs (59.4 lbs) net, 32kgs (70.4 lbs) in shipping carton

Accuphase T-100

LOW DISTORTION AM-FM STEREO TUNER

A superior tuner can significantly enrich audio life today for there is an abundance of broadcast reproduction matter which provides great opportunities to expand one's tape library through careful air checking. The ideal tuner should come close to connecting the broadcast studio to the amplifier, and eliminate the medium of radio waves. Thus, it should be able to cut the noise, interference and distortion that is picked up with the radio waves during its transmission, to a level which cannot be detected by the ear.

This is where the main emphasis was placed in designing the Accuphase T-100 Tuner. In addition, special attention was paid to performance stability against external variables such as incoming signal levels, changes of temperature, humidity and time, as well as on smooth-working tuning and switching mechanisms. In short, the most advanced electronic and mechanical techniques were called upon to develop this outstanding tuner.

Two basic functions are required of tuners: the ability to catch and select radio waves as in the case of a receiver's front end, and to amplify and demodulate them, without causing distortion as is so important in audio equipment. The difficulty is that the characteristics of the two requirements are so mutually opposed, that often one tends to suffer when the other is improved. It is a fact that to solve this problem requires the highest technology and considerable expense.

In developing the Accuphase T-100 tuner, we have met this challenge by developing latest radio frequency techniques and by adding required new circuitry unsparingly. The result is something we are proud of introducing, and we are sure that you will come to have a special attachment for this tuner too!

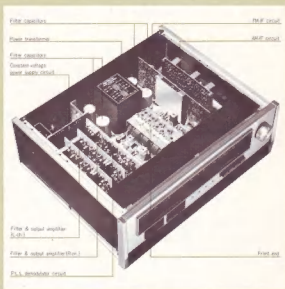
ADVANCED DESIGN FM FRONT-END

FM signals picked up by the antenna are tuned and amplified by the RF amplifier, then mixed with the local oscillator signal in the converter circuit to form a 10.7 MHz intermediate frequency (IF) signal. This circuitry constitutes what is known as the front-end, which plays a vital role in determining a tuner's value. This section must be able to amplify weak signals well, handle strong signals without distorting, and have the capability to remove completely all radio frequency noise and interference.

The T-100 meets these requirements well by utilizing a linear frequency, 5-gang tuning capacitor, double tuned RF amplifier stages, complete inter-circuit shielding, local oscillator buffer circuit, and dual gate FET's in all RF and converter circuits, etc. This is attested by performance ratings for spurious signal rejection of better than 100 dB. Image rejection is also better than 90 dB. The T-100 also has a 245 mm (9-1/2") wide, slide-rule type dial which has linear frequency indications at 250 kHz intervals that is combined with precision tuning mechanism to ensure smooth, accurate tuning.

15-STAGE LINEAR PHASE FILTER IN FM IF CIRCUIT

The 10.7 MHz IF signal from the front-end enters the IF amplifier circuit where it is amplified and fed to the detector while adjacent frequency signals are rejected. This rejection (IF selectivity) is normally the function of transformers or mechanical filters in conventional tuners. The T-100, however, employs a newly developed 15 stage Linear Phase Filter combined with an integrated circuit to obtain better rejection and, at the



same time, less distortion. Thus, selectivity was made compatible with sound quality, as attested to by the performance ratings for distortion of less than 0.1% and effective selectivity of more than 70 dB, which significantly surpass the limitations of past tuners.

WIDEBAND FM DETECTOR

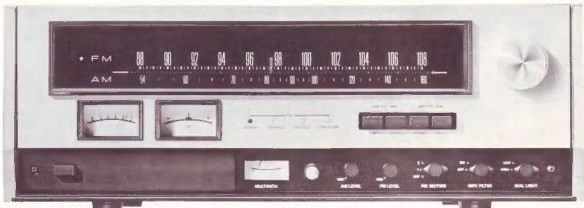
In order to demodulate the linear phase amplified IF signal without distortion into an audio signal, the former is fed to a special detector circuit which employs a 1,200 kHz wide discriminator which has three times the width of those normally used. This has contributed to significant improvement in stereo characteristics.

PHASE LOCKED LOOP STEREO DEMODULATOR

We have avoided all use of coil and capacitor tuned circuits in the stereo demodulator which separates the audio signal into left and right channel stereo signals. Instead we have used the most advanced Phase Locked Loop Stereo Demodulator which automatically locks the phase of the subcarrier generator with that of the incoming pilot signal. This accounts for the excellent ratings for stereo separation of better than 45 dB (1 kHz), and distortion of less than 0.2% on stereo. It also ensures long life and dependable performance.

INDEPENDENT MULTIPATH METER

In addition to the Signal and Tuning meters, an independent Multipath



meter is provided inside the front sub-panel. Multipath signals, like TV ghost signals, cause distortion which harm FM stereo sound quality. To avoid them, the FM antenna should be oriented for minimum deflection of the Multipath meter.

LOW DISTORTION AM TUNER

Good quality broadcasts are also available on AM, although frequency response is narrower. AM has usually been treated as an accessory by most high fidelity manufacturers, and has received very little new design considerations. However, as a result of a new type detector circuit, optimum bandwidth research and use of expensive MOS and J type FET in the front-end and IF stages, we can offer low distortion, noise-free AM music performance with the T-100.

OTHER FEATURES

The front sub-panel contains a 2-step muting switch, a stereo noise filter control, independent AM and FM level controls, and dial light control. The Multipath meter lamp lights automatically when the sub-panel cover is opened.

GUARANTY SPECIFICATIONS

PERFORMANCE GUARANTY:

Products of Accuphase guarantee specifications stated;

FM Monophonic Performance:

SENSITIVITY: 2.0 μ V, least usable sensitivity
2.0 μ V for 40 dB of quieting
4.5 μ V for 50 dB of quieting

ULTIMATE S/N: 75 dB at 200 μ V input

ULTIMATE THD: (at 50 μ V input, 100% modulation.)
100 Hz: will not exceed 0.1%
1,000 Hz: will not exceed 0.1%
10,000 Hz: will not exceed 0.1%

INTERMODULATION DISTORTION: will not exceed 0.2%
(Antenna input 1 mV, 100% Mod, 70 Hz: 7 kHz = 4 : 1)

AUDIO FREQUENCY RESPONSE: +0, -1 dB 20 Hz to 15,000 Hz

SELECTIVITY: Alternate channel: 70 dB

CAPTURE RATIO: 1.5 dB

IMAGE REJECTION: 90 dB (at 100 MHz)

IF REJECTION: 100 dB

SPURIOUS REJECTION: 100 dB

AM REJECTION: 60 dB at 1 mV input

OUTPUT: 2.0 Volts

FM Stereo Performance:

SENSITIVITY: 20 μ V for 40 dB of quieting
45 μ V for 50 dB of quieting

ULTIMATE S/N: 70 dB at 2 mV input

ULTIMATE THD: (at 500 μ V input, 100% modulation)
100 Hz: will not exceed 0.2%
1,000 Hz: will not exceed 0.2%
10,000 Hz: will not exceed 0.5%

AUDIO FREQUENCY RESPONSE: +0, -1 dB 20 Hz to 15,000 Hz

STEREO SEPARATION: 35 dB at 100 Hz
45 dB at 1,000 Hz
30 dB at 10 kHz

STEREO AND MUTING THRESHOLD: 2-step switching at 5 μ V and 20 μ V

SCA REJECTION: 60 dB

19 kHz, 38 kHz REJECTION: 70 dB

AM Performance:

SENSITIVITY: 15 μ V DISTANCE
150 μ V LOCAL

S/N: 50 dB

(Antenna input level 1 mV, 30% Mod, at 1 kHz)

THD: will not exceed 0.5%
(Antenna input level 1 mV, 30% Mod, 1 kHz)

SELECTIVITY: 30 dB

IMAGE REJECTION: 70 dB

IF REJECTION: 60 dB

WHISTLE FILTER: -30 dB at 10 kHz

OUTPUT: 0.6 Volts (30% Mod.)

GENERAL:

TUNING CAPACITOR:

FM: Frequency Linear 5-gang
AM: 3-gang

OUTPUT IMPEDANCE:

Audio Output FIXED: 200 ohms
Audio Output CONTROLLED: 2.5 k ohms

FM ANTENNA INPUTS: 300 ohms balanced; 75 ohms unbalanced

METERS: Signal strength Meter
Center Tuning Meter
Multipath Meter

POWER REQUIREMENT:

Voltage selector for 100V, 117V, 220V, 240V 50/60 Hz operation
Consumption: 25 Watts

SEMICONDUCTOR COMPLEMENT:

7 FET's, 45 Transistors, 9 IC's, 43 Diodes

DIMENSIONS:

445mm (17 1/2 inches) wide, 152mm (6 inches) high, 355mm (14 inches) deep

WEIGHT:

14 kgr. (30.8 lbs.) net, 18.3 kgr. (40.6 lbs.) in shipping carton.

